Cell Metabolism

Editorial

Focus on Immunometabolism

Biology has surprising twists and turns. Immunology and metabolism, two disciplines that had evolved somewhat in parallel, have meandered back, intersecting to create the burgeoning field of immunometabolism. The past decades have seen a striking increase in obesity together with type 2 diabetes. As researchers tackle this "large" problem from numerous angles, the role of the immune system in energy metabolism has progressively become recognized in light of the deleterious effects of cytokines, such as TNFα, in obesity and insulin resistance. It is now also established that obesity is associated with chronic low-grade inflammation and that several immune cell types contribute to obesity-associated metabolic dysfunction, such as type 2 diabetes, hepatosteatosis, and cardiovascular diseases.

So, what are the active players in immunometabolism? What are the mechanistic underpinnings of the metabolic-immune cross-talk? Can we target the immune system to curb the rise in metabolic diseases associated with the obesity pandemic?

In our June issue of *Cell Metabolism*, we are delighted to offer a collection of Reviews, Perspectives, and Minireviews discussing various aspects of immunometabolism, from mediators and signaling pathways to therapeutic opportunities. For many years, studies have focused primarily on the role of macrophage subsets in obesity-associated inflammation. In the first Perspective, Diane Mathis (851–589) explores the more recent implication of a number of additional innate and adaptive immune cell types that infiltrate visceral fat and discusses the respective roles of these cells in adipose tissue inflammation. Marc Donath and colleagues (860–872) review how the immune system senses metabolic stress in obesity and diabetes, focusing on islet inflammation and clinical translation. Richard Flavell and colleagues (873–882) pick up the discussion on metabolic inflammation and introduce how innate immune receptors, specifically TLRs and NLRs, integrate dietary and environmental factors—including via the regulation of gut microbiota—to determine metabolic disease progression in multiple tissues. In their Perspective, Martin Blaser and Laura Cox (883–894) further elaborate on the fascinating interactions between diet, gut microbes, and host immunity in obesity and discuss how perturbations such as gastric bypass surgery, pregnancy, and hibernation affect this complex biological system. Doug Green and colleagues (895–900) complete this special focus by examining emerging questions related to how metabolism and autophagy, especially LC3-associated phagocytosis, could intersect to influence the function of macrophages and, ultimately, the innate immune response to pathogens.

We hope that this special focus on immunometabolism will provide a springboard for further discussions on this exciting topic. We very much look forward to continuing to witness and participate in the many more discoveries that will bring us closer to unveiling the mysteries of the metabolic-immune dialog and shrink the diabetes/obesity problem. We also hope that you will join us in person for the related Cell Symposium "Immunometabolism: From Mechanisms to Therapy" about to take place in Toronto June 9–11.

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